

What is Claimed:

- 1 1. A composite paperboard structure comprising a backing
2 structure adhered to a paperboard layer, said backing structure consisting of:
 - 3 a) an oriented polymer film layer;
 - 4 b) a thermal bonding polymer layer adjacent and substantially
5 coextensive thereto, said thermal bonding polymer layer having a thickness between
6 10% and 40% of a combined thickness of the oriented polymer film layer and the
7 thermal bonding polymer layer; and
 - 8 c) a reinforcing scrim polymer layer adjacent and substantially
9 coextensive with the thermal bonding polymer layer.
- 1 2. The composite paperboard structure of claim 1, wherein said
2 polymer film layer, said bonding polymer layer and said reinforcing scrim all have a
3 chemical composition that permits recycling said backing structure without
4 separating the layers thereof.
- 1 3. The composite paperboard structure of claim 1, wherein the
2 oriented polymer film layer, the thermal bonding polymer layer, and the reinforcing
3 scrim polymer layer each individually comprise a synthetic condensation polymer,
4 the synthetic condensation polymers each comprising, in polymerized
5 form:

6 1) a) a carboxylic acid or a mixture of carboxylic acids, and
7 b) either i) a diamine or a mixture of diamines, or ii) a diol or a mixture of
8 diols, or

9 2) an ω -amino acid having more than 2 carbon atoms, or a
10 mixture of such amino acids,

11 wherein, for the backing structure taken as a whole,

12 at least 90 mol% of a combined total amount of the carboxylic acid or
13 the mixture of carboxylic acids in the synthetic condensation polymers is the same
14 carboxylic acid,

15 at least 90 mol% of a combined total amount of the diamine or the
16 mixture of diamines in the synthetic condensation polymers is the same diamine,

17 at least 90 mol% of a combined total amount of the diols or the
18 mixture of diols in the synthetic condensation polymers is the same diol, and

19 at least 90 mol% of a combined total amount of the amino acid or the
20 mixture of amino acids in the synthetic condensation polymers is the same amino
21 acid.

1 4. The composite paperboard structure of claim 3, wherein the
2 oriented polymer film layer comprises biaxially oriented polyethylene terephthalate.

1 5. The composite paperboard structure of claim 4, further
2 comprising a second backing structure as defined in claim 1 adhered to the
3 paperboard layer.

1 6. The composite paperboard structure of claim 4, wherein the
2 thermal bonding polymer layer comprises an amorphous copolyester of about 60 to
3 about 90 mol% ethylene terephthalate and correspondingly about 40 to about 10
4 mol% ethylene isophthalate.

1 7. The composite paperboard structure of claim 4, wherein the
2 backing structure is adhered to the paperboard layer via an adhesive layer.

1 8. The composite paperboard structure of claim 7, wherein the
2 adhesive layer comprises an amorphous copolyester of about 60 to about 90 mol%
3 ethylene terephthalate and correspondingly about 40 to about 10 mol% ethylene
4 isophthalate.

1 9. The composite paperboard structure of claim 4, wherein the
2 reinforcing scrim polymer layer comprises a woven or nonwoven material comprising
3 polyester fibers.

1 10. The composite paperboard structure of claim 4, wherein the
2 paperboard layer is adhered to the reinforcing scrim polymer layer.

1 11. The composite paperboard structure of claim 10, further
2 comprising a metal layer adjacent and substantially coextensive with the oriented
3 polymer film layer.

1 12. The composite paperboard structure of claim 4, wherein the
2 paperboard layer is adhered to the oriented polymer film layer.

1 13. The composite paperboard structure of claim 12, further
2 comprising a metal layer adjacent and substantially coextensive with the reinforcing
3 scrim polymer layer.

1 14. The composite paperboard structure of claim 8, wherein the
2 thermal bonding polymer layer comprises an amorphous copolyester of about 60 to
3 about 90 mol% ethylene terephthalate and correspondingly about 40 to about 10
4 mol% ethylene isophthalate.

1 15. The composite paperboard structure of claim 4, wherein
2 paperboard layer is a corrugated paperboard layer.

1 16. The composite paperboard structure of claim 15, wherein the
2 paperboard layer is adhered to the reinforcing scrim polymer layer.

1 17. A container comprising a plurality of walls defining a cavity for
2 containing an article, wherein at least one of said plurality of walls comprises a
3 composite paperboard structure comprising a backing structure adhered to a
4 paperboard layer, said backing structure consisting of:

5 a) an oriented polymer film layer;

6 b) a thermal bonding polymer layer adjacent and substantially
7 coextensive thereto, said thermal bonding polymer layer having a thickness between

8 10% and 40% of a combined thickness of the oriented polymer film layer and the
9 thermal bonding polymer layer; and

10 c) a reinforcing scrim polymer layer adjacent and substantially
11 coextensive with the thermal bonding polymer layer;

12 wherein the oriented polymer film layer, the thermal bonding polymer
13 layer, and the reinforcing scrim polymer layer each individually comprise a synthetic
14 condensation polymer,

15 the synthetic condensation polymers each comprising, in polymerized
16 form:

17 1) a) a carboxylic acid or a mixture of carboxylic acids, and
18 b) either i) a diamine or a mixture of diamines, or ii) a diol or a mixture of
19 diols, or

20 2) an ω -amino acid having more than 2 carbon atoms, or a
21 mixture of such amino acids,

22 wherein, for the backing structure taken as a whole,

23 at least 90 mol% of a combined total amount of the carboxylic acid or
24 the mixture of carboxylic acids in the synthetic condensation polymers is the same
25 carboxylic acid,

26 at least 90 mol% of a combined total amount of the diamine or the
27 mixture of diamines in the synthetic condensation polymers is the same diamine,

28 at least 90 mol% of a combined total amount of the diols or the
29 mixture of diols in the synthetic condensation polymers is the same diol, and

30 at least 90 mol% of a combined total amount of the amino acid or the
31 mixture of amino acids in the synthetic condensation polymers is the same amino
32 acid.

1 18. The container of claim 17, wherein the oriented polymer film
2 layer comprises biaxially oriented polyethylene terephthalate.

1 19. The container of claim 18, wherein the paperboard layer is
2 adhered to the reinforcing scrim polymer layer.